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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE•

NOVEMBER 17, 1934

Sphinxes of the Pacific

See Page 314

A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

Cats, like men, cannot see in absolute darkness.

Germany is waging active war on clothes moths.

The eye condition known as astigmatism or "distorted focus" was not recognized until 1801.

The skeleton of a Neandertal child was unearthed recently in the Vezere Valley, France.

Using paper film, state health authorities have found that 100 children can be X-rayed in 40 minutes.

According to the latest list, there are 159 nationalities represented in the Union of Soviet Socialist Republics.

The great crusaders' castle known as Krak des Chevaliers, in Syria, has been ceded to France for preservation.

The University of California has been awarded a certificate of honor for breeding a new rust-resistant snapdragon.

Skin eruption blamed on the dye in socks may actually be caused either by the dye, the material, or the finish.

Those long-snouted members of the bear family, the sloth bears, live mainly on an insect diet.

Many Spanish words brought to America by soldiers and colonists are obsolete in Spain today but still live in the Spanish spoken in the Southwest.

Scientists are to spend five months next year in the high mountains of Cashmir, India, studying the effects of high altitude on man and animals.

The oldest Egyptian mummy known is said to be that of Ra-Nofer of the third dynasty, about 2900 B.C., now in the Royal College of Surgeons in London.

At the "trachoma school" on the Fort Apache Reservation in Arizona, 300 Indian children will receive intensive treatment for this eye ailment and some incidental schooling.

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These curiosity arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the articles, but the references for further reading. Books cited can be supplied by Book Department, Science News Letter at Publishers' prices, postpaid in the United States.

PHYSICS

Air a Hundred Miles Up May Be Warm as a Summer Day

World-Wide Investigation of Radio Signal Reflection Also Shows Wave Action in Upper Ionized Region

FURTHER proof that the layers of ionized atmosphere of the earth from 62 to 124 miles above sea level have a fairly constant temperature regardless of the time of day, night or season is presented in a report (*Physical Review, Nov.* 1) prepared by Dr. E. O. Hulburt of the Naval Research Laboratory.

Moreover, new data taken by many investigators scattered all over the world indicate that the temperature of the high altitude layer may be as great as that of an average summer's day at the earth's surface, about 80 degrees Fahrenheit.

"Best agreement between the radio facts and the theoretical calculations is found," Dr. Hulburt reports, "if the temperatures of these levels is taken to be rather warm, above 300 degrees Kelvin."

A degree Kelvin is the unit of the absolute temperature scale. A figure of 300 degrees Kelvin corresponds to 80.6 degrees Fahrenheit.

Dr. Hulburt's preliminary report was prepared from data forwarded to him by scientists working at the Department of Terrestrial Magnetism of the Carnegie Institution and the National Bureau of Standards, both of Washington.

Observations were obtained in such widely scattered places as Watheroo, Western Australia; Huancayo, Peru; Washington; Fairbanks, Alaska; and in New England and Nova Scotia during the solar eclipse.

145 Miles Up

Taking advantage of the reflection of radio signals from the ionized layers scientists have further investigated the characteristics of the layer known as F2. This layer of the ionosphere begins about 145 miles above sea level and continues up to 220 miles. Layer F2 is above the layers E and F1 whose temperature varies within 86 degrees Fahrenheit no matter what the time of day or season.

Radio studies of the ionization in the F2 regions for different times of day, Dr. Hulburt indicates, fit in with the belief that great waves of ionized atmosphere move about in this region. As the ionized air spreads out from a point directly below the sun in all directions, part of it moves with the rotation of the earth and part against the rotation. Eastward the ionized wave moves with the earth and should resemble water waves, having a smooth form, perhaps like ground swells.

The part of the wave going westward moves against the earth's rotation and, Dr. Hulbert postulates, "is checked and is caused to whitecap, as in a tide rip." That is, the top spills over the bottom of the wave.

Observations made on the magnetic equator substantiate this view and record a greatly disturbed and erratic layer of ionization in the morning hours, with a maximum at 10 a. m. A minimum occurs at noon and then there is a smoother, less disturbed ionization in the afternoon, with a broad maximum at from 6 to 8 p. m.

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ASTRONOMY

Astronomer Explains Star Going Two Ways at Once

THE mystery of stars which go two ways at once, the outer part expanding and the inner part contracting, is cleared up by the South African astronomer A. E. H. Bleksley of the University of Witwatersrand (*Nature, Oct.* 27).

The two-way stars are the pulsating stars known as the "Cepheid variables." They are relatively common. Their paradoxical action of expanding and contracting at the same time in different places was explained by Mr. Bleksley as the result of his calculations on the temperatures and luminosities of several of the stars, particularly the one known technically as RS Boötis.

It was assumed by scientists that such stars ought to be the hottest and brightest when they reached the greatest contraction. Astrophysicists were therefore puzzled to find that when the star was getting brighter and brighter its outer atmosphere was moving toward them, or away from the center.

The finding of this kind of star action threw doubts on the whole "pulsation" theory of the Cepheid variable type of star.

Astronomers will probably be glad Mr. Bleksley has explained away the paradox by showing that while the oscillations of stellar atmosphere exist, they differ in phase or time by approximately one quarter of the total period for one complete "pulsation" of the star. Taking this phase difference into account the time of maximum brightness, maximum temperature and minimum radius (most contraction) still coincide just as they should in a world that follows the laboratory findings of the physicist.

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TECHNOLOGY

Glass Tops on Tin Cans Made of Telescope Material

A NEW type glass top for tin cans enabling purchasers to see the contents has been developed by the Corning Glass Works. The glass is the same kind used in making great telescope mirrors such as the new 200-inch diameter instrument of the California Institute of Technology.

Because of the low expansion of the

FOR TIN AND TELESCOPE

The same material that allows the astronomer to gaze at the stars is now being placed in can tops to allow the housewife to see her vegetables.

glass when heated it is possible to solder the tin can onto the glass without need for a close-fitting gasket. So strong is the glass-to-tin joint that in tests the glass breaks before the tin-glass union.

The development makes it possible to ship cans with glass ends to the cannery and pack in the contents just as is done now for all metal cans. In the food processing it is often necessary to place the filled can in a steam autoclave and then suddenly cool it with water to prevent over-cooking. The special glass resists, satisfactorily, this drastic treatment.

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MEDICINE

Artificial Radioactivity Seen As Aid in Cancer Fight

Man-Made Radioactivity May Prove To Be Effective Substitute For Expensive Radium in Medicine

THE STRUGGLE of medical science to combat cancer has been materially aided by the recent discovery of ways to make many common elements radioactive by artificial means, Dr. G. Failla, head of the physical laboratories of Memorial Hospital, New York City, has informed Science Service.

Dr. Failla's encouraging statement was made in reply to a request for interpretation of the announcement by Prof. E. O. Lawrence of the University of California that a way had been found to make sodium radioactive and have it give off penetrating gamma rays and beta rays. (*See SNL, Oct. 27 p. 259*). Gamma rays from man-made radioactive sodium are over twice as piercing as those from the most powerful natural sources, thorium C".

The main difficulty in the treatment of cancerous tissue by radiation, Dr. Failla declares, has been to find some carrier which will distribute itself fairly uniformly throughout the tumor without diffusing into the surrounding normal tissue and through the blood stream. No such selective carrier is available at present although chemists the world over have been searching for it for decades.

Opens New Fields

"The advent of artificial radioactivity opens new fields of cancer research," Dr. Failla declares. "In their search in the past for chemical agents suitable for the treatment of cancer, chemists have concentrated their attention on agents which damage the living cell hoping to find something which would kill cancer cells without harming irreparably normal cells and the patient as a whole.

"With the coming of radioactivity induced by artificial means it is only necessary to look for something which is selectively or even differentially absorbed or temporarily retained by cancer tissue.

"When and if such a substance is found it will then be possible to make one or more of its constituents artificially radioactive. By virtue of its greater concentration in cancer tissue such tissues would be destroyed readily by the radioactive rays while normal tissue would survive.

Need Not Be Gamma

"In this connection," Dr. Failla continued, "it should be noted that radiation emitted by artificially produced radioactive material need not be of the gamma ray type. Any radiation which either directly or indirectly produces ionization is satisfactory for this purpose since the source of the rays would actually permeate the cancer tissue and ionize it intensely."

Prof. Lawrence's discovery of a way to make artificially radioactive sodium, giving off gamma rays with a half life of fifteen hours, has an important bearing, Dr. Failla reports, on the field of cancer therapy for it may develop that it is possible to use it as a substitute for radium and the radioactive gas radon obtained from radium, for the external treatment.

The life of radioactive sodium—based on its half life of fifteen hours—is too short, Dr. Failla believes, to allow its insertion directly into a tumor. Unless very large quantities are available constant replacement would be necessary.

While one immediately thinks of making up a solution or suspension of radioactive sodium, perhaps as salt, and injecting this directly into tumors the problem is fraught with difficulties known for many years, Dr. Failla declares (See *Archives of Radiology and Electrotherapy, June*, 1920).

Fifteen years ago scientists at Memorial Hospital prepared radioactive salt by exposing it to radon for three hours so that the disintegration products—radium A, B and C—were deposited on the salt. By dissolving this special salt in water a radioactive solution was obtained which could be injected directly into tumors, or into the blood stream for special cases where there was a general neoplasmic condition throughout the body.

The method was tried extensively on animals and human patients but was finally abandoned. Radioactive oils and suspensions of charcoal containing radon, or its disintegration products, were also tried at Memorial Hospital with little success, Dr. Failla indicated.

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BIOCHEMISTRY

Study Concentration of Viruses as Clue to Nature

TOO SMALL to be seen; too many to count. It sounds like an old riddle but it is merely a rough way of describing the innumerable tiny particles which make up the viruses that cause diseases like infantile paralysis in humans and tobacco mosaic in plants.

For these infective particles are so small they can not be seen even with powerful microscopes. As to counting them, 10 with fourteen ciphers written after it, may represent the number of infective particles in about 20 drops of juice squeezed from a plant infected with tobacco mosaic, Dr. William J. Robbins of the University of Missouri estimates.

These figures are highly speculative, Dr. Robbins pointed out (*Science, Sept. 21.*) They are based on the assumption that one-tenth of a gram or about two grains of infective material having a molecular weight of 100,000 exists in a little over six quarts of plant juice.

Here again the scientist is assuming: first, that one molecule of infective material weighs 100,000 times as much as one molecule of hydrogen; and second, that the yield of infective principle from the plant juice is 100 per cent.

Dr. Robbins' calculations are based on

experiments of several other scientists. Some of these investigators have estimated the size of virus particles from the size of the holes in a filter that they pass through. Others have estimated the concentration of virus in infected plant juice. One found that one part of infected tobacco plant juice diluted in ten thousand parts of water still contains infective material.

The layman's interest in these impressive figures is largely a matter of curiosity and wonder over the size and concentration of the substances that can cause him so much personal harm or financial loss.

The scientist's interest is related to the isolation of the infective principle of viruses. One as yet unsettled question about viruses is whether or not they actually are living organisms.

As Dr. Robbins explains it, if the tobacco mosaic virus, for example, is nonliving attempts now being made to isolate it as a definite chemical compound will eventually succeed, provided a sufficient number of infective particles are present in a cubic centimeter of juice.

Put in another way, if scientists can finally isolate a virus as a definite chemical compound, they will know that viruses are not living substances at all.

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PHYSICS

New Band of Ultraviolet Found in Sun's Rays

A WHOLE new band of ultraviolet light rays in the radiation the earth receives from the sun has been detected by the Swiss scientists Edgar Meyer, M. Schein and B. Stoll. The discovery is believed to have an important bearing on future astronomical research.

In their report (*Nature, Oct.* 6), it is disclosed that sunlight is not completely cut off at about 2,800 Angstrom units of wavelength as previous research indicated.

An Angstrom is a unit of length equal to a bit less than four billionths of an inch. The ultraviolet region from 2,900 to 3,100 Angstroms consists of rays which have an actinic effect and cause sunburn.

It had always been supposed, as far as proof was concerned, that the ozone in the earth's atmosphere absorbed sunlight of wavelength shorter than those of the 2,800 to 2,900 Angstrom region. Theory predicted otherwise but careful searches to find sunlight of shorter wavelength were unsuccessful in the past.

Using special apparatus which counts individual photons of light energy instead of employing a photographic plate, the Swiss scientists were able to jump the gap caused by ozone absorption from 2,800 to 2,400 Angstroms and detect the new ultraviolet peak having a maximum of 2,100 Angstroms. The new-found rays started to come through at 2,400 Angstroms. So delicate was the method that the intensity was traced to nearly 1,900 Angstroms. The oxygen in the earth's atmosphere should cut off solar radiation less than 1,800 Angstroms of wavelength.

The research was carried out in a laboratory atop the Jungfraujoch in the Swiss Alps, at an altitude of 3460 meters—over two miles.

The new findings have important possibilities for high-altitude measurements of radiation from the sun and stars. Mirrors using aluminum instead of silver coatings have recently extended the ultraviolet astronomical front from 3,400 down to 2,300 Angstroms.

Now, at one stroke, astrophysicists can jump the gap caused by ozone absorption and reach still shorter wavelength regions of the solar spectrum. Another important contact with sunlight is thus established.

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ANIMAL HUSBANDRY

Sheep Reared Successfully On a Synthetic Diet

THE first two sheep ever reared upon synthetic diets have just been slaughtered in a Cornell University scientific experiment. They never tasted grass or grain but thrived on purified food elements. Scientists foresee the possibility of more rigorous nutrition experiments upon cows, goats, sheep, rabbits and other herbivorous animals as the result.

Reared by Dr. L. L. Madsen of Cornell's Animal Nutrition Laboratory, they were beautiful, mature animals although they never received a blade of grass nor a kernel of grain from the time they were weaned from their mothers. Each day for over a year they were fed a "synthetic" mixture of casein, cellulose, starch, vitamin concentrates and salts. They grew to maturity rapidly and were about a year and a half old at the time of slaughter.

This success in raising "synthetic" sheep ends seven years of trials to perfect a diet of purified foodstuffs for plant-eating, herbivorous, animals. Such

CAN YOU PICK THE "SYNTHETIC" SHEEP?

The two beautiful animals on the ends of the line have never tasted a blade of grass or a kernel of grain, but have thrived on purified food elements. A conventional grass-grain fed sheep is shown in the center for comparison.

diets are useful for studies with such animals as rabbits, guinea pigs, sheep and goats because one substance at a time can be added to or subtracted from such mixtures. The development of such diets for white rats about 20 years ago led to many of the modern discoveries in the science of nutrition concerning vitamins, minerals and proteins. With these new diets such studies will become possible with herbivorous species. These species include the foster mothers of the human race, the cow and the goat, as well as sheep. They also include the smaller animals such as rabbits and guinea pigs which are widely used in laboratories for the study of disease.

The "synthetic" sheep proved to be in excellent condition and free from one of the most common of the parasites which are found in almost all the sheep of the region. From observations upon these animals it is thought that these new diets may afford novel methods of freeing sheep from the usual parasites that inhabit the digestive tracts of sheep.

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OCEANOGRAPHY

Amazing Landscape Lies Beneath the Pacific Ocean

If the Water Could be Drained from California Coast Scenic Marvels Would Be Revealed to Onlookers

By PROF. FRANCIS P. SHEPARD,
Of the University of Illinois

IF SOME force could remove the waters of the ocean to a depth of two miles, residents of Monterey peninsula, on the California coast, could look out onto one of the scenic marvels of the world.

Directly off Pacific Grove they could look down a canyon wall to a floor 7,000 feet beneath their level and they could see a 5,000-foot wall rising on the farther side. If they were standing at the end of the peninsula, they could see another impressive canyon coming out of the present Carmel Bay, receiving many tributaries along its course, to where it joined the main Monterey Bay canyon.

The fishermen who inhabit the sparsely settled coast around Cape Mendocino, in northern California, would see a series of canyons directly off their homes that would compare to the greatest valleys of the west slope of the Sierra Nevada.

The residents of La Jolla, near San Diego, would be given a surprise through the appearance of a deep chasm with almost vertical walls, which would be seen extending out from the present day sea cliffs north of the Scripps Institution of Oceanography. Gorges such as this would become the show places of the new California coast.

It is natural to be curious about the origin of these remarkable gashes in the sea floor. There is no evidence that would allow us to believe that these great rock canyons could have been cut out of the sea bottom by the feeble currents of the deeps. Neither do they contain the basin depressions cut by unusual marine currents in such places as the Golden Gate, where the tide is accentuated by the narrowness of the entrance and the vast size of the bay. These canyons were more likely produced by some process now observable on land.

There are three main types of deep land valleys: those excavated by the ice, of which the Yosemite Valley is a classic example; those cut by rivers, of which the Yellowstone Canyon is typical; and finally those due to faulting of blocks of the earth's crust, of which Death Valley and Owen's Valley in California are splendid illustrations. Each of these types has definite characteristics, as you will know if you are familiar with the examples cited.

Of the three the river-cut canyons are the most distinctive as they have a rough V-shaped cross section in contrast to the U-shape of the glacial valleys and the trough shape of the fault valleys. Also most of the river valleys are much more winding in their courses than the others, and have tributary systems very much like the branches of a tree or the veins of a leaf.

When we compare these characteristics of deep stream valleys with those of the submarine canyons we find decided agreement, and the new surveys seem to leave little doubt but that the great canyons of the sea floor were excavated by ancient rivers at a time when the land margins were greatly elevated.

The significance of these deeply submerged river canyons off the California coast is a cause of bewilderment. It has been generally assumed by geologists that the California coast is rising. It undoubtedly has risen, as anyone can see from the marine shells in the gravel deposits on the numerous beaches now well above sea level. Why then do we have on the one hand these submerged river valleys as evidence of a rising coast? The difficulty is removed by the assumption that there was first a large subsidence which drowned the canyons and later a more moderate uplift which raised the narrow wave-cut benches.

The straightening of the California coast and the cutting of wave terraces following the submergence of the canyons must have consumed a long period of time and therefore the submergence must have been very remote. There are reasons to believe it occurred more than a million years ago.

Comparisons between old and new marine surveys have to be made with care and used with reservations; but such comparisons off the California coast at least strongly suggest that there have been changes in depth during the last 50 years. Such changes were inferred in the submarine canyons off Redondo, off Newport, and off Carmel. In each case the new surveys give evidence of decided deepening. It seems probable that the canyons despite the usual slow filling with sediments are deepened from time to time by these mud flows.

The submarine canyons are of some practical importance to man. They allow navigators to determine definite positions at sea during a fog. They constitute good fishing grounds because of the rocky ledges on their sides. Where the heads of the canyons come in close to the coast the deep water has made a favorable situation for the building of piers. Filling at these piers has proved less troublesome than at the ends of most other piers off the California coast.

However, this location may be fraught with difficulties, since the canyon represents a funnel down which the bottom deposits may slide or be swept by storm waves.

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CHRONOLOGY

Time Signals Now Broadcast Twenty Times Each Day

TWENTY times daily, every hour on the hour except at 9 and 11 a. m. and 9 and 11 p. m., eastern standard time, a time signal is now broadcast from the U. S. Naval Observatory, through the naval radio station at Arlington. Formerly signals were transmitted only six times daily. The new service was inaugurated several weeks ago on an experimental basis, and it is now expected that the schedule will be made permanent.

With the new schedule astronomers and other scientists who need to know the time with the greatest accuracy can check their clocks more frequently. Seismologists, who study earthquakes, can record the signals directly on the seismograph records, along with the wavy lines produced by the vibrations of an earthquake. This will permit more accurate location of earthquakes in distant parts of the world. The service will be especially valuable to amateur astronomers, not equipped with the precision clocks of their professional colleagues. Even a cheap watch will run accurately enough for an hour, if it can be set before and after.

Long Wave

The twenty-hour-a-day signal is broadcast from NAA, the Arlington station, on a frequency of 113 kilocycles, or 2635 meters, too long a wave for ordinary broadcast receivers. The hours at which signals are omitted are used for long established broadcasts, in code, which could not be discontinued. In addition to the 113 kilocycle transmission, NAA also sends out signals from the Observatory at six different times during the day on eight frequencies ranging from 64 to 16,820 kilocycles. Only one, on 690 kilocycles, is in the broadcast range, with signals at noon and ten p. m., eastern standard time. Station NSS at Annapolis broadcasts some of the signals on short wave, and they are rebroadcast from NPG at San Francisco and NPM in Honolulu.

A vibrating crystal of quartz is now used to control the clock which transmits the signals, and connection is made by wire with the radio stations at Arlington and Annapolis. This clock was recently developed by Capt. J. F. Hellweg, superintendent of the Observatory, and Paul Sollenberger, in charge of the time service. It is frequently checked with the standard clocks of the Observatory, which show star time and gain about four minutes daily on ordinary clocks.

Five Minutes To the Hour

Each signal, as formerly, begins at five minutes before the hour, a short buzz marking each second. The twenty-ninth second of each minute is omitted, and so are the 56th, 57th, 58 and 59th. In addition, the 51st, 52d, 53d, 54th and 55th of the last minute are omitted. Thus the beginning of the next signal after the ten-second pause marks the exact hour. One other second of each of the first four minutes is also omitted. These are the 51st second of the 55th minute, the 52d second of the 56th minute, the 53d second of the 57th minute and the 54th second of the 58th minute. This is not as complicated as it sounds. It simply means that when there is a one-second pause, followed by four signals and a long pause, the beginning of the next thereafter marks the fourth minute before the hour. If three signals followed the short pause, it will be three minutes before the hour, and so on.

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ASTRONOMY

Reinmuth Comet Back on a Visit

REINMUTH'S comet of 1928, first seen by Prof. K. Reinmuth of Heidelberg Observatory on Washington's birthday, 1928, has been rediscovered by Dr. H. M. Jeffers of Lick Observatory at Mt. Hamilton, California. This is the report of Dr. Harlow Shapley, director of Harvard College Observatory, which is the coordinating center for astronomical data.

Between one and two o'clock Pacific Standard Time in the morning of Nov. 5, Dr. Jeffers first caught sight of the diffuse, faintly glowing object north of the constellation of Orion, which at this hour is slightly southwest of the zenith overhead.

Reinmuth's comet is not observable with the human eye or even weak telescopes. Powerful instruments are needed to detect the faint object of the sixteenth magnitude of brightness. No tail is yet reported.

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INTERNATIONAL BRIDGE

A traffic link joining Germany and Denmark is now being stretched across the tempestuous Baltic Sea between Jutland and Fuenen. Because of rough water, construction of the new bridge was begun at piers in the middle and pushed simultaneously toward both shores. The German end, shown above, is now complete, and the Denmark part is expected to reach completion early in 1935.

PHYSIOLOGY

Mother's Milk Found To Check Hemorrhage

MOTHER'S milk has a very special power to hasten the clotting of blood and therefore to control hemorrhage or bleeding, Prof. A. Solé reported recently to the Vienna Association of Physicians.

Curiously enough, animal milk does not have the same power to clot blood nor does colostrum, the preparatory milk secreted by the mammary glands during the first day or two after the birth of a baby.

Boiling the milk destroys the blood-clotting property, as the active substance, whatever it may be, cannot withstand heat. But the human milk may be dried and an extract of the powder used to check bleeding. This extends its usefulness, since a supply can be kept on hand for use when fresh human milk is not available.

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ASTRONOMY

Astronomers Uncertain Of Next Bright Comet

THOUGH dozens of comets have been observed through observatory telescopes in the last few years, and many more as bright are expected in the near future, astronomers do not know when one brilliant enough to be conspicuous to the eye will make its appearance. It is reasonable to expect "one or more great comets some time within the next fifty years but whether one will come next week or next year or not in the next ten years, no one can say." So reports Dr. Robert G. Aitken, director of the University of California's Lick Observatory. (*Astronomical Society of the Pacific Leaflet* 69).

During the nineteenth century, he states, "five comets of the first rank appeared and at least six others that were fairly brilliant." One of these was Halley's, which returned in 1835. Another was the Great Comet of 1882. Halley's made its next visit in 1910, and while astronomers have not yet calculated the exact position and date of its next return, which will depend upon the amount that it is pulled by the gravitational attraction of the planets, it is confidently expected about 1985.

All the other bright comets that have appeared in the past, says Dr. Aitken, have their periods "numbered in hundreds of years, and not one is known well enough to permit the prediction of even an approximate date for its return. When one comes, it will come unheralded."

Astronomers will be able to study it with facilities not available previously, he declared. "The modern astrophysicists are far better equipped for observations in these lines than were the observers of the Great Comet of 1882 or even those of Halley's Comet in 1910. When the next great comet appears they will apply every resource at their command to study every phenomenon it presents, and they are eager to enjoy the opportunity," he said.

Science News Letter, November 17, 1934

ARCHAEOLOGY

Turkey Goes Modern by Restoring Istanbul

IN RECENT years Turkey has stressed modernization. New alphabet, feminist progress, the latest in governments.

Now there is activity of another sort. Istanbul, one of the truly glamorous cities of the Old World, is being remade. But there is no cause for shuddering. This is no dream of a super-city of futuristic angles to overshadow old Istanbul. Just the opposite.

Istanbul is to reappear as it was before the Turkish invasion in 1453, Mustapha Kemal Pasha, president of the Republic of Turkey, has decided. Plans are under way.

Like President Roosevelt, Kemal Pasha calls in professors when he wants certain types of advice. To show what the city called Constantinople was like in the Middle Ages, a professor of the history of architecture at the Academy of Fine Arts has prepared maps based on old charts and records of different periods before the Turkish invasion.

With certain modern buildings torn down and historic structures restored, Istanbul will have back many long-lost vistas and skylines. The famous Mosque of Saint Sophia is undergoing extensive repairs. Gardens of Byzantine emperors are to bloom again. Parks, palaces, and religious structures are being restored.

In recent years, Rome has been busy resurrecting ancient grandeurs. The United States has its small but lovely restoration of a colonial town at Williamsburg. After all, by restoring the medieval Constantinople, Turkey is showing in one more way her determination to keep up with the times.

Science News Letter, November 17, 1934

IN SCIENCE

ZOOLOGY

Big Lizards Apparently Able to Die Voluntarily

DEATH seems to be preferred to captivity, by a species of iguana, big, formidable-looking but really harmless tropical lizards, collected in the West Indies by Dr. Paul Bartsch of the U. S. National Museum. The strange thing about their voluntary demise, however, is that they apparently can die by just wishing to be dead. They seem to be the only animals thus able to stop living by a mere act of will.

Dr. Bartsch states that lizards of this species, captured alive and uninjured, would frequently be found dead after a few minutes, with no sign about them of how they had taken themselves off.

Among the specimens collected by Dr. Bartsch, Dr. Doris M. Cochran, Smithsonian Institution herpetologist, discovered eight species of reptiles hitherto unknown to science.

Science News Letter, November 17, 1934

INVENTION

Inventor's Institute Lists 895 Needed Inventions

WITH every person a potential inventor and many taking the matter seriously, the Institute of Patentees compiled a list of 895 needed inventions in connection with its recent Tenth International Exhibition of Inventions.

Someone ought to invent, for example:

1. An instrument for showing the pressure in automobile tires at sight without having to remove a valve cap.
2. A cheap photo-electric cell to fit inside the bulb of an automobile headlight so that the light would be dimmed at the approach of another car.
3. A captive golf ball for use in winter to indicate where it would have landed if played in the ordinary way.
4. A non-skid road.
5. Some form of table napkin with strings that will not slip off the knees.
6. A cheap automatic device to awaken the deaf.

Science News Letter, November 17, 1934

NCE FIELDS

SEISMOLOGY

Earthquake Shakes Bering Sea Bottom

THE sea bottom at the edge of the Bering Sea, just north of the Aleutian Islands, was shaken by a moderately strong earthquake that began at 6:02.4 p. m., eastern standard time, on Monday, Nov. 5. Scientists of the U. S. Coast and Geodetic Survey, Washington, D. C., evaluating wire and radio dispatches sent to Science Service by a number of seismological observatories, gave the location of the epicenter as in 52 degrees north latitude, 176 degrees west longitude.

The stations reporting were those of the Manila Observatory, Manila, P. I.; the U. S. Coast and Geodetic Survey, Honolulu; and the Jesuit Seismological Association observatories at Georgetown University, Washington, D. C., Canisius College, Buffalo, N. Y., and St. Louis University, St. Louis, Mo.

Science News Letter, November 17, 1934

PSYCHIATRY

Stuttering Cured By Hypnotism

HYPNOTISM has been successfully used by U. S. Public Health Service doctors at the Marine Hospital, San Francisco, in curing patients of stuttering, Dr. Victor H. Vogel, U. S. Public Health Service, reports.

The method includes revelation and aeration of the cause and suggestion to the patient under induced hypnosis. It is especially applicable when the cause is of psychogenic origin, that is, psychic injury, such as severe abuse or fright occurring early in life, when the mind is most impressionable.

In some of the cases the causative incident remains only in the patient's subconscious mind and can not be recalled during the normal waking state; but when hypnotized, the patient readily relates all details. The suggestion is then given to the patient while in the state of hypnosis that, knowing the cause of his stuttering, he can overcome it. Success is not so marked when the cause is not revealed.

One patient, who could not recall the causative incident before being hypnotized, readily related it under hypnosis and recalled it to mind after being awakened. In this case the patient when about 7 years of age had been severely whipped by a drunken father and locked up in a small room all night for having bought candy with a nickel that he had earned running an errand. While under hypnosis he spoke without stuttering. He was cured by three treatments. Two months later he wrote that "new worlds are open to me now." A year later he wrote that he was "selling insurance, which calls for enough talking." In normal conversations his speech was perfect, he said, while he slightly lost control and stammered "a bit" in times of excitement.

While the terms "stuttering" and "stammering" are generally considered to be synonymous, in a limited sense stuttering has been applied to a repetition of sounds or syllables, as distinguished from stammering, which is a hesitation or difficulty in voicing sounds.

Science News Letter, November 17, 1934

ASTRONOMY

Tiny Planet Hidalgo Being Watched By Astronomers

HIDALGO is back! Astronomers in various parts of the world are now observing the little planet which has come into view again through large telescopes after being invisible since 1925, the year following its discovery. Hidalgo is of interest because it looks like an asteroid, one of the family of tiny planets whose orbits lie mostly between those of Mars and Jupiter, but moves like a comet. It is inclined to the ecliptic, the path of the sun through the sky, by some 37 degrees, more than that of any other asteroid, an amount which is not unusual for a comet.

Hidalgo was rediscovered in August by W. R. Boyd, of the Harvard Observatory, and was recently picked up at the Simeis Observatory in Russia by Prof. G. Neujmin. It is moving through the constellation of Pisces, high in the southwestern sky in the late evenings. As it is of the twelfth magnitude, only powerful telescopes are able to reveal it. Dr. F. L. Whipple, of the Harvard Observatory, is particularly interested in it, and hopes that photographs will settle whether it is really a comet or not.

Science News Letter, November 17, 1934

PHOTOGRAPHY

Photography Now Possible On Aluminum Surfaces

A NEW process which makes possible durable photographs on metallic plates of aluminum and its alloys has been culminated by the firm of Siemens and Halske A.-G. in Berlin For many years it has been known that aluminum and its alloys would attain oxide films which would absorb with avidity solutions of pigments and thus attain brilliant color effects.

The new method takes advantage of the porosity of such oxide films by having them absorb light-sensitive substances instead of pigments. The aluminum sheets are dipped successively in solutions of aluminum chloride and silver nitrate and dried after each immersion. Other silver salts, iron salts and diazo bodies can also be used to make the metal plate light sensitive.

Finished photographs made on metallic films are characterized by great durability because the film of oxide protects the underlying aluminum from chemical and mechanical influences. Such photographs, therefore, will resist the effects of light, water and weather.

Even if the aluminum is placed in a fire so hot that it is melted the picture or text on the oxide part of the plate will still be clearly visible. In contrast also to ordinary pictures the metallic photographs are resistant to organic solvents such as benzole, benzine, ether, alcohol, and acetone.

The commercial uses of the process are highly important. Maps, texts, scales on measuring instruments, dials of all kinds, are but a few.

Science News Letter, November 17, 1934

METEOROLOGY

Only Two Hurricanes During 1934 Season

ADD 1934 crop failures: West Indian hurricanes. Only two storms of hurricane proportions came twisting and roaring out of tropical American waters during the entire season, U. S. Weather Bureau records show.

The paucity of hurricanes this year is all the more striking when contrasted with the all-time high record for 1933, when no less than 21 of these meteorological monsters developed, some of them causing heavy property damage and loss of life.

Science News Letter, November 17, 1934

ARCHAEOLOGY

Explore Mystery Isle

Scientists Vie in Attempt to Solve Riddle Of Great Stone Faces on Lonely Island of the Pacific

By EMILY C. DAVIS

See Front Cover

EASTER ISLAND, loneliest inhabited isle in the Pacific, will be invaded by two scientific expeditions this year.

A party of French-Belgian-Swiss scientists has already landed. Americans will arrive later. The men of science will climb grassy hillsides of the island to peer at hundreds of great stone faces that have so far out-sphinxed the sphinx in determined silence about the past.

In some long-ago era of hustling energy, Easter Islanders turned out statuary by the ton. Using volcanic craters on the island as quarries, the people carved out heads and torsos—little fellows three feet high; big fellows twenty, thirty feet, even one giant 70 feet tall. Both men and women were portrayed.

They had a pattern for their art, and they stuck to it. The stone faces had to have long noses, disdainful mouths, jutting eyebrows.

In another quarry, workers ran a stone hat factory, hewing out a red tinted stone for top hats to adorn the heads of the gray stone giants. A red hat for a 30-foot giant would weigh fully three tons.

When an image was finished, the workers slid it down the hillside, and then somehow pulled or pushed the statues—some weighed as much as 40 tons—to an appropriate site. All the faces were made to turn inland, toward the graves of Easter Island's dead.

More Than 600

The world's strangest art gallery came to have over 600 of the images. And then one day the workers dropped their crude stone tools in the workshops and never came back. Their masterpiece, a giant that would have stood 70 feet tall, lies unfinished there among other partly carved work to this day.

Every one who sees the images of the island, or pictures of them, thinks of questions to ask:

Were the images meant for idols, or portraits of ancestors, or guardians of the dead?

Did important men get big statues, and plain citizens smaller statues?

What catastrophe put an end to the business?

And who were these artists of a forgotten school of sculpture anyway?

The last question can be answered, to an extent. The others haven't been answered yet, nor many more that you can think of.

The natives of the island today are of a mixed type, some dark, some light. It is realized that the Pacific in prehistoric times was ably navigated by Polynesians who could make voyages of a thousand miles or so in their large canoes. They had bamboo charts on which they marked the courses of guiding stars. So, it is not hard to understand how Easter Island could have been reached by adventurous expeditions, and a settlement made there. The modern natives have traditions about the stone figures and other island antiquities. The memories have worn thin, and fact and fiction are confused. But it is generally supposed that the ancestors of these natives were indeed the possessors of Easter Island's famous old culture.

Mystery Not Solved

Accepting that, however, does not begin to solve the mystery. The problems that scientists want to have explained are harder:

Did the first settlers come to the island from South America, or from the west from other islands? That is, was this island an offshoot of America's ancient history, perhaps linked with the Indians of Peru who were adepts at feats of handling tons of stone? Or was the island's past rooted in some Asiatic homeland?

And did the first settlers bring their uncanny knowledge of stone work and other advanced cultural ideas to the island? Or did they make their own inventions on the spot after they arrived?

If an American anthropologist can show how the giant statues and their makers fit into the world's ancient history, he will win an international contest of wits that has been going on for years.

Easter Island has come to be known as the explorers' delight. The cloud-scraping mountain peaks of the world may be climbed one by one, and checked off the "things to be done" list. The poles may be flown over and photographed, and that's finished. But Easter Island goes on forever. Almost every year, recently, has seen some restless explorer sailing for Easter Island, two thousand miles from the shores of Chile and over a thousand from the nearest island neighbors. Presently the restless explorer is back with strange and entertaining things to tell. But he hasn't spoiled the mystery to any marked extent for the next man to follow him.

A double-barreled attack in one year, however, looks serious. The Europeans have come half way round the world to spend seven months concentrating on the stone faces and the island's other chief evidence from the past, its ancient picture writing.

In all the isles of Polynesia this speck of an island was the one place where aboriginal people could read and write. That written language, consisting of rows of birds, humans, and less obvious designs, is a forgotten system. But language experts refuse to give up. Some signs they have translated.

WRITTEN WORDS

The National Museum at Washington has several rare pieces of Easter Island writing, on wooden slabs. How the islanders came to have a written language is one of the island mysteries, yet to be solved.

A few years ago, the British Royal Anthropological Institute appointed a committee to see what it could do about the Easter Island writings. The committee came back in 1932 with its opinion that the wooden slabs contain, not connected narratives, but notes such as an orator might use to remind him of facts and points in a discourse.

Whence the Language?

Still, the writings continue to attract scholars, who want particularly to know whether the islanders got their language from some distant points, or made it up themselves. A written language is a great achievement for men to produce without outside inspiration. One language specialist thought he could find significant clues in the writing, pointing to a link with ancient India.

The present European expedition to Easter Island is handicapped by the recent death of Prof. Luis Wathelin, specialist on inscriptions, who was to have checked on such points as this.

The American scientists who are turning their faces toward the southern Pacific have a more varied program than the French-Belgian-Swiss group of scientists. The Americans are to voyage 13,000 miles through the South Seas, with the primary object of gathering data for four habitat groups of South Sea Island birds for the American Museum of Natural History. Three American Museum scientists are accompanying Templeton Crocker, leader of the expedition.

Easter Island is one of the scheduled stopping places for the expedition, however, and an anthropologist is aboard the yacht. So, at that point, birds must take second place in the expedition's thoughts.

Shortly before the expedition sailed, one member visited the National Museum at Washington to examine the rare specimens of Easter Island writing on wooden slabs in the national collections. The National Museum profited by the trip of the U. S. S. Mohican to the island in 1886, when Paymaster William Thomson of the Navy wrote a scientific report on the place and brought to Washington several of the wooden inscriptions and two of the sorrowful-looking stone images.

Not a Scientist

Had Admiral Jacob Hoggeveen, eighteenth century Dutch explorer, been a man of science, he could have perhaps solved the mystery of Easter Island before it became nearly so mysterious. When he stepped on the island Easter morning 1722 and named the island after the day, the great stone images were not lying flat and neglected as they now are. He saw the images in all their towering dignity, standing on great stone platforms.

But the Admiral's mind was on other matters than scientific inquiry. His sailors had a fine scare when they neared the island and saw the curious excited natives that were milling about the shore. An excited Dutch sailor fired a shot, and there was scuffling. The natives begged for mercy and brought offerings to the strangers. The Dutch party spent the rest of the day on the island in peace, and had a look at the nearby stone images, which they promptly assumed to be extra-big idols.

Voyagers Gaped

Spanish, English, and French ships adventuring in the Pacific touched upon Easter Island about fifty years after the Dutch visit. They measured the stone images, and gaped at the size. They made friends with the women and the Frenchmen returned home singing the praises of the grace and beauty of these native belles who resembled Europeans in color and feature. But they neglected to question the native maidens about their ancestors, or the cultural aspects of the islands' life or its theories about monumental stone art—unfortunately.

By the time the scientific importance of the island was attracting attention, many changes had taken place. Slave raiders carried off the cream of the population, including rulers, priests, and educated men, to work in guano fields of Peru. Smallpox and tuberculosis preyed on the remaining inhabitants, reducing the number from perhaps several thousand to several hundred. Missionaries came, establishing missions and discovering that the island once had the dignity of learning, with men who could read ancient records and write down important happenings.

Can't Read the Characters

There remained on Easter Island, for science to study, only a hundred or so natives whose chief duty is to work for a Chilean sheep ranch on the island. Some proudly claim ability to read the old wooden tablets cherished in a few homes. But skeptical scientists have found that these natives are merely reciting, as a child points to any page in a book and glibly reels off Little Bo Peep.

Confused traditions and ideas gleaned from much quizzing of the modern islanders shed little light on one of the really remarkable cultures of the past.

Some years ago, a theory was advanced that only civilized men could have handled the problem of moving and placing the stone statues, or have evolved the Easter Island writing. This theory assumed that Easter Island must be the remaining tip of a continent that sank beneath the sea in some frightful disaster.

Fantastic, is the reply of scientists to

LONG AGO

French voyagers, in the eighteenth century, measured the stone statues and sang the praises of the belles of Easter Island. But they neglected to question the native maidens about the island's curious and already fading past—unfortunately for science.

this theory today. No continent has settled to a watery grave carrying chapters of human history down with it. That is to say, no major change in the world's geography of this sort has happened in man's lifetime.

So far as Easter Island itself is concerned, the sea very near the island drops off sheer 12,000 feet. It has been aptly pointed out that if this terrain were lifted, the whole island would be well above the snow line, and that would mean that sculpture factories flourished in a chilly, rarefied atmosphere, far from suitable for such work.

Science News Letter, November 17, 1934

GEOGRAPHY

Maps of the World Displayed For World Geographers

International Congress at Warsaw Had Largest Exhibit of Maps; Aerial Photography Also Studied

By DR. ISAIAH BOWMAN, **President, International Geographical Congress at Warsaw; Director, American Geographical Society and Chairman, National Research Council.**

THE largest and most diversified map exhibition of its kind in the world was the outstanding feature of the International Geographical Congress at Warsaw from which the American delegates have recently returned.

The map is the symbol of the geographical profession. In the Congress the cartographic papers, discussions and exhibits were naturally most important.

An entire building was devoted to the exhibition, to which 50 institutions from 25 nations contributed maps.

Practically all official cartographic services of the world sent exhibits. About a dozen American universities and research organizations, as well as government bureaus, contributed material for the exhibit. The first exhibit to be inspected by President Moscicki, head of the Polish Republic, when he opened the exhibition, was that of the United States Geological Survey.

There were exhibited archaeological maps made on the one to one-millionth base maps, and the steady progress of this enterprise was encouraging. It consists of putting upon this internationally recognized base map the location of various types of archaeological remains. One map shows Roman Britain, and from it the reader sees at once where the known remaining sites — walls, forts, baths, etc.—may now be found.

There was also a special meeting devoted to an historical account of the development and progress of the one to one-millionth international map of the world. At this meeting it was reported that the compilation of the 102 sheets of Hispanic America now in preparation by the American Geographical Society of New York would be completed by the end of 1934, and that the fair drawing would be completed by the end of 1935.

The Congress paid considerable attention to aerial photography as an aid to mapping. One of the principal publications of the Congress was a report of a Commission on Photogrammetry dealing with progress in this field. This was one of the seven Commissions that have been working during the past three years and which contributed valuable reports to the Congress. A new Commission was appointed at the Warsaw meeting—one on Climatic Variations. It is hoped to give this matter special attention in the next four years during which the Commission is to prepare material for the next Congress.

Honored By President

The Congress was honored at the opening by the presence of President Moscicki, the head of the Republic. Present also were some of the members of the Cabinet and representatives of foreign embassies. The attendance was approximately 1,000. The meeting was held in the Court of the Polytechnic Institute. There were 44 nations represented by about 300 foreign delegates. The total membership of the Congress was about 870.

President Moscicki also received the delegates on the terrace of the Palais Royale, overlooking the Vistula. The members of the Congress were also received by the Prime Minister of Poland and by the Mayor of Warsaw. At the final banquet the Congress was honored by the presence of M. Beck, Minister of Foreign Affairs, and also by the Minister of Culture and Public Education.

Made Excursions

Before and after the Congress excursions were conducted by experienced geographers to various parts of Poland. They were of particular interest to the foreign delegates because of the fact that Poland has so recently been reconstituted. A part of it was formerly under the sovereignty of Austra-Hungary, another part was held by Germany, and the greater part was included in so-called "Congress Poland," a province of former Russia. To put these three parts together into a working political organization, to integrate their economic life, including their transportation systems, and to organize the political machinery and cultural institutions effectively was the first task of the leaders of Poland, and it was of interest to the members of the Congress to see the diversity of the country and the steps taken to make out of that diversity a harmonious whole. The technical or professional aspects of the excursions were also of broad interest because of the fact that few geographers from other countries had visited some of the less accessible parts of Poland and all were eager to see a land situated so far toward the East.

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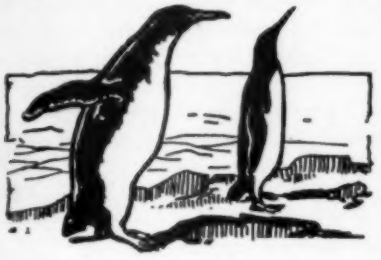
ORNITHOLOGY

NATURE RAMBLINGS
by Frank Thone



Peculiar Pete

PETE the Penguin, popularized in public knowledge by recent Antarctic explorations, would rival the pelican as a "wonderful bird," if only some inspired limericker would arise to sing his praise.

He is, for one thing, among the very few flightless fowl that still make good use of wings. There are plenty of birds that fly little or not at all, but they either use them only for ineffectual flapping on land, like the late-lamented dodo, or they permit them to disappear altogether, like the kiwi, still, though diminishingly, with us.

Not so the penguin. On land, with his short legs and plumeless pinions, he is so helpless, so politically-human in appearance and conduct, that it has become a standard newsreel joke to insult him with a black bow tie, as though he were about to go to a state dinner.

But once in the water, those seemingly useless wings suddenly come alive. They become intensely useful, fitting the bird with powerful forward propellers to match his thrusting webbed feet aft. He turns into a living submarine, with a slashing fish-trap at the prow—and woe to the luckless fish he picks out for his prey!

Another peculiarity of the penguin is his emphatic preference for the Southern Hemisphere. Antarctica, and the sullen lost islands that circle the desolate seas about that frozen continent, constitute his chosen home. During the Antarctic winter he swims away in search of better fishing northward, but he still sticks in southern waters. Not for him the record-breaking migrations of such flying birds as the Arctic tern, which twice a year change hemispheres, perpetually seeking lands of the midnight sun.

In only one place in the world does the penguin make his home above the equator—the Galapagos islands, south of Panama and west of Ecuador. Among the almost unearthly animal inhabitants of this rocky group, which started Darwin on his world-revolution in scientific thought, there is a species of penguins found nowhere else. They never migrate, but remain as permanent inhabitants of the southernmost margin of the Northern Hemisphere.

These Galapagos penguins are not isolated from their kind—an endemic islet of life far away from the natural austral-polar range of other penguin species. Along the Pacific coast of South America, especially in Chile, there are other penguin species; so that the gap is not as great as it might seem.

One of the oddest of penguins is to be found among these Chilean birds. Unlike other penguins, it does not live and nest on the flat rocky shore, but fairly high up on steep earthly slopes covered with brush. It slides down to work at its trade of fishing every morning, and at night laboriously ascends the slope again to its nest. And its nest is made in a burrow in the ground!

Truly, Pete the Penguin, is Peculiar.

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PLANT PHYSIOLOGY

Blue Light Most Effective In Causing Plants to Bend

WHEN plants in a window-box, or potato sprouts in a dark cellar bend toward the light as they grow, they are not responding equally to all the colors in the great mixture of lights we call white light. Toward red light they will not bend at all, while on the other hand there are certain wavelengths in the blue region of the spectrum, toward which they are especially sensitive.

Recent researches at the Smithsonian Institution, reported before a Washington botanical audience by Dr. Earl S. Johnston of the Institution's staff, have picked out very sharply the particular wavelengths that are most potent in stimulating plant bending. The most effective of all light wavelengths is a very narrow band in the neighborhood of 4400 Angstrom units, which is in the blue part of the spectrum. From this point the effectiveness of light in producing bending falls off rapidly to a point near 4600 Angstrom units, which is still in the blue region. Then it rises again to a secondary peak at about 4750 Angstrom units, a slightly greenish blue, and then drops to an "almost-no-effect" point beyond 5000 Angstroms, in the red.

In carrying out his experiments, Dr. Johnston used plants themselves—young oat seedlings—as pointers. At one end of a long, darkened box was a standard lamp. At the opposite end was another lamp, with suitable filters to permit only light of the desired wavelengths to pass through. The seedlings were placed between these lights, and permitted to "choose," indicating the light having the greater effect by bending toward it.

The standard lamp was moved back and forth, until one of the seedlings indicated "no choice," showing that the two light sources were in balance. Then a sensitive light-measuring instrument was substituted for the seedling, to obtain the relative amounts of energy put forth by the two lights. In this way a sensitivity curve for the effectiveness of all parts of the spectrum was built up, based on the "choices" of many hundreds of seedlings.

Science News Letter, November 17, 1934

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First Glances at New Books

Anthropology

AN INTRODUCTION TO CULTURAL ANTHROPOLOGY—Robert H. Lowie—*Farrar and Rinehart,* 365 p., 37 pl., $4. Most students are slow, Prof. Lowie has found, in acquiring elementary knowledge of human culture. Some flounder even after starting professional work. To "forestall such wasteful confusion" is the aim of this text, which certainly offers an orderly and clean-cut exposition of essentials. It is not a "heavy" book. Casual readers, merely curious to know how the other half of the world lives, will find it full of striking and thought-provoking facts about the human race.

Science News Letter, November 17, 1934

Ornithology

LIFE HISTORY OF THE GAMBEL QUAIL IN ARIZONA—David M. Gorsuch—*University of Arizona Press,* 89 p., 25c.

Science News Letter, November 17, 1934

Biography

SAMUEL PIERPONT LANGLEY—C. G. Abbot—Smithsonian Miscellaneous Collections, vol. 92, No. 8; *Smithsonian Institution,* 57 p., 30c. Upon the occasion of the centenary of the birth of the first Secretary of the Smithsonian Institution, the present secretary has written an illuminating biography, giving considerable detail about Langley's work in astronomy and aeronautics.

Science News Letter, November 17, 1934

Child Hygiene

THE CHILD, HIS ORIGIN, DEVELOPMENT AND CARE—Florence Brown Sherbon—*McGraw-Hill,* 707 p., $3.50. This very comprehensive discussion is designed for the college woman who intends to make a career of home-making and motherhood. Always keeping the viewpoint of the child-as-a-whole, the book includes scientific information on the origin of life, heredity, reproduction, the physical and mental development of the child up to school age, and the care of both mother and child. There is a glossary of scientific terms which together with the easy, direct style of writing will make the book useful to many young mothers besides the college trained group for whom it is written.

Science News Letter, November 17, 1934

Art—Archaeology

METROPOLITAN MUSEUM STUDIES, VOLUME V, PART I—*Metropolitan Museum of Art,* 145 p., $4. An enlightening article on the psychology and aesthetics of forgery in art by Hans Tietze opens this collection of papers. The five authors who follow discuss certain Greek vases, the Archaic Apollo in the Metropolitan, and other topics of artistic, archaeological, and architectural interest.

Science News Letter, November 17, 1934

Juvenile

ALL AROUND THE CLOCK—Lena Towsley—*Farrar & Rinehart,* $1. A delightful book of photographs with a minimum of text which will make it a pleasure to learn to tell time.

Science News Letter, November 17, 1934

History

THE DISCOVERY AND RE-DISCOVERY OF AMERICA—Thomas Peter Christensen—*Laurance Press, Cedar Rapids, Iowa,* 133 p., cloth, $1.50, paper 65c. "How and when was America discovered?" continues to be an intriguing topic. This simply written, very entertaining, small book takes stock of present knowledge of Vikings, later Norse and other explorers, the Kensington rune stone, and finally Columbus. Despite an admitted enthusiasm for Nordic achievements, the author steers a wary course among facts and theories.

Science News Letter, November 17, 1934

Arctic Exploration

NORTHERN LIGHTS — F. Spencer Chapman — *Oxford Univ.,* 264 p., $2.50. A new, lower-priced edition of a fine book of Arctic adventure. The story is that of the 1930 British Expedition to Greenland to explore a Northern Air Route between America and Europe. There are a number of excellent pictures.

Science News Letter, November 17, 1934

Medicine

X-RAY AND RADIUM INJURIES, PREVENTION AND TREATMENT—Hector A. Colwell and Sidney Russ—*Oxford,* 212 p., $4.75. A very valuable book for physicians and others who work with X-rays and radium. The last chapter, X-ray and Radium Quackery, deserves wide reading, particularly by those authorities who are in position to put into effect the authors' urgent suggestion that radioactive substances should be classed with poisons and their sale and use correspondingly restricted.

Science News Letter, November 17, 1934

Petroleum

A. S. T. M. STANDARDS ON PETROLEUM PRODUCTS AND LUBRICANTS—Committee on Petroleum Products and Lubricants—*American Society for Testing Materials,* 340 p., $1.75.

Science News Letter, November 17, 1934

Archaeology

THE MATERIAL CULTURE OF PUEBLO II IN THE SAN FRANCISCO MOUNTAINS, ARIZONA — Katharine Bartlett—*Northern Arizona Society of Science and Art, Flagstaff,* 76 p., $1.50. A handbook, conveniently arranged and nicely illustrated, summing up knowledge gained from 100 Indian sites of the period just preceding the highest stage of Pueblo culture.

Science News Letter, November 17, 1934

Hygiene

HYGIENE FOR FRESHMEN—Alfred Worcester—*Charles C. Thomas,* 151 p., $1.50. Much above the average in readability is this compact text on hygiene for college students. Dr. Worcester has written it with an appreciation of the fact that most young men at college are so healthy that the formal study of hygiene seems an unnecessary bore. The "sugar coating" he gives the subject is never obvious and seems to be achieved by relating hygienic facts to things college students might be really interested in and not to what professors think they should be interested in. The book although written for college freshmen may be enjoyed by a much larger group of readers.

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History

THE GREATER SOUTHWEST—Rupert Norval Richardson and Carl Coke Rister—*Arthur H. Clark Co., Glendale, Calif.,* 506 p., $4. Nearly one-third of the

RADIO

Tuesday, November 20, 4:30 p. m.

DOING SOMETHING FOR DUCKS
By J. N. Darling, Chief of the Bureau of Biological Survey, U. S. Department of Agriculture.

Tuesday, November 27, 4:30 p. m.

HARNESSING SCIENTIFIC DISCOVERIES, by Dr. P. G. Agnew, Secretary of the American Standards Association.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

United States is included in the greater Southwest, the history of which is told in this volume. Beginning with the arrival of Spanish conquerors, the scene is peopled with traders and trappers, Indians and cattlemen, Mormons, gold seekers, soldiers, and boomers. The two authors, professors of history, have given a remarkably complete picture of the economic, social, and cultural evolution of the most colorful region of the United States.

Science News Letter, November 17, 1934

Chemistry

CHEMISTRY FOR BEGINNERS—E. J. Holmyard—*E. P. Dutton,* 223 p., $1.00. British text on elementary inorganic chemistry for students of grammar school age. The discussion on formulae and chemical equations may prove useful to people several times as old.

Science News Letter, November 17, 1934

Engineering

PILE TRESTLES AS CHANNEL OBSTRUCTIONS—David L. Yarnell—*Govt. Print. Off.,* 26 p., 10c. U. S. Dept. of Agr. Technical Bull. No. 429.

Science News Letter, November 17, 1934

Economics—Finance

CONTEMPORARY LEGISLATIVE AND BANKING PROBLEMS—*American Institute of Banking,* 324 p., $1.50. A textbook giving a nontechnical treatment of the laws, services and regulations resulting from the economic crisis and a discussion of the banking problems resulting.

Science News Letter, November 17, 1934

Economic Geology

SOME RECENT METHODS OF MAGNETIC PROSPECTING—Irwin Roman, Thomas C. Sermon and C. O. Swanson—*Michigan Coll. of Mining and Technology,* 22 p. Appearing as Vol. 8, No. 1 of the Bulletin of the Michigan College of Mining and Technology.

Science News Letter, November 17, 1934

Electricity

AUDELS NEW ELECTRIC SCIENCE DICTIONARY — Frank D. Graham — *Theo. Audel & Co.,* 525 p., $2. Definitions of over 9,000 words used in the field of electricity and electrical engineering.

Science News Letter, November 17, 1934

Anthropology

CHAN KOM, A MAYA VILLAGE—Robert Redfield and Alfonso Villa R—*Carnegie Institution of Washington,* 387 p., paper cover, $4.25; cloth cover, $5.25. Prof. Redfield's study of how an aboriginal people acquires European civilization has attracted much interest. Here is a detailed report of one stage of the process. It describes the mode of life in a village of Yucatan where Mayan Indians are about midway between the old life and the new. Progress comes unevenly, it appears, as some powerful motives pull human beings forward while other motives equally strong hold them back in other ways.

Science News Letter, November 17, 1934

Chemistry

THE REACTION BETWEEN HYDROGEN AND OXYGEN—C. N. Hinshelwood and A. T. Williamson—*Oxford,* 108 p., $3.25. A monograph which collects the many papers of the last few years on the fundamentally important union of hydrogen and oxygen.

Science News Letter, November 17, 1934

History

WORLD CIVILIZATION—Hutton Webster and Edgar Bruce Wesley—*D. C. Heath,* 844 p., $2.12. World history in one volume for a one-year study course. The value of getting this sort of panoramic view of civilization has been stressed lately in colleges. This text, with its numerous illustrations and maps, its attractive style, and various study devices, seems likely to meet the exacting demands of such a course.

Science News Letter, November 17, 1934

Health

SEX-HYGIENE: WHAT TO TEACH AND HOW TO TEACH IT—Alfred Worcester—*C. C. Thomas,* 134 p., $2.50. A series of straightforward discussions, largely from the masculine viewpoint, which should be helpful to physicians, parents, teachers and clergymen in giving instruction and guidance on the subject.

Science News Letter, November 17, 1934

History

MEDIEVAL AND MODERN TIMES (2nd rev. ed.)—James Harvey Robinson—*Ginn,* 825, xliii p., $2. In this revised text, Prof. Robinson carries us through history from the Huns to Hitler. To aid students to understand the past and comprehend the present, this historian adopts the "unit system," which is to say he deals, not with periods of history, but with topics of key importance in the successive stages.

Science News Letter, November 17, 1934

Economics

THE ECONOMIC INDEPENDENCE OF POLAND—Paul F. Douglass — *Ruter Press, Cincinnati,* 134 p., $2. A monographic study in the trade adjustments and political objectives of the nation.

Science News Letter, November 17, 1934

History

BERNARDO DE GALVEZ IN LOUISIANA, 1776-1783—John Walton Caughey—*University of California Press,* 290 p., $3.50, paper $3. The first comprehensive biographical study of a neglected hero, who rendered service to the colonies in their revolt against England. Galvez was governor of Louisiana.

Science News Letter, November 17, 1934

Anthropology

SEXUAL LIFE OF SAVAGES—Bronislaw Malinowski—*Harcourt, Brace,* 603 p., 95 illustrations, $3.75. A one-volume edition of a well known anthropological study among natives of the Trobriand Islands. Taking a broad definition of sex, including its sociological and cultural ramifications, Dr. Malinowski shows the part sex plays in the culture of a people quite unlike modern Europeans.

Science News Letter, November 17, 1934

Zoology

THE AMPHIBIANS OF KANSAS—Hobart M. Smith—*Am. Midland Naturalist,* 151 p., 35c. An entire number of The American Midland Naturalist is devoted to this monograph of the amphibians of a region hitherto imperfectly worked out. Zoologists, especially those interested in animal distribution and ecology, will welcome this study.

Science News Letter, November 17, 1934

Science News Letter will secure for its subscribers any book or magazine in print which was published in the United States. Send check or money order to cover regular retail price ($5 if price is unknown, change to be remitted) and we will pay postage in the U. S. When publications are free, send 10c. for handling. Address Book Dept., Science News Letter, 21st and Constitution Ave., Washington, D. C.

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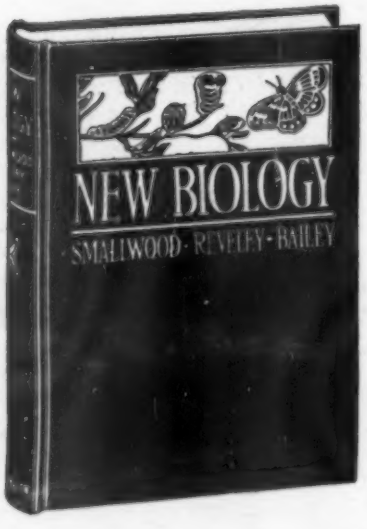
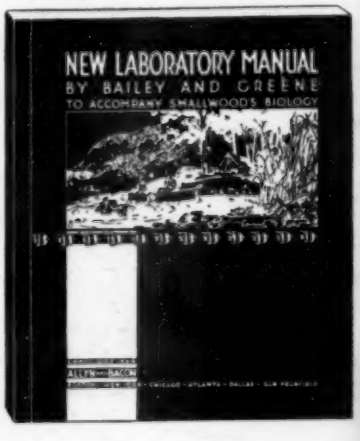


In general, biology is the study of the fundamental functions of living things, thus enriching the student's own life; in particular, it is the creating of scientific attitudes toward ourselves and our living environment. It parallels in its objectives the cardinal aims of education.

The biological unit is the *living* individual. It is through the study of the life processes common to all living things that the fundamental facts of human living are learned. Out of this mass of old and new facts comes the knowledge of the interrelationship of man to the plant and animal world. The need for conservation of plant and animal life and the need of development and improvement of all living organisms result as a natural corollary.



The textbook is the medium for transmitting facts. It should not only teem with facts, but it must provide a program of pupil activities. It must furnish plenty of indoor laboratory work for the discovering of facts and proof, and field work for stimulating interest in life processes. It must emphasize Health by establishing habits of physical and mental well-being; Vocation by discovering interests and aptitudes as a help in vocational guidance; Leisure by developing leisure-time activities; Citizenship by presenting situations which have direct bearing on home life, group conduct, and human service.

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